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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :
HANS-JOACHIM HAEHNLE, ET : EXAMINER: CORDRAY, D.R.
AL.
SERIAL NO: 10/581,459 :
FILED: JUNE 1, 2006 : GROUP ART UNIT: 1741
FOR: FILLER-CONTAINING PAPER AND A METHOD FOR THE
PRODUCTION OF FILLER-CONTAINING PAPER

REPLY BRIEF

This Reply Brief is timely filed no later than October 3, 2011, with no extension of time. This Reply Brief responds to the clearly erroneous findings of fact regarding the prior art disclosures, the erroneous claim interpretation, and the erroneous conclusion that the appealed claims are unpatentable based thereon, in the Examiner's Answer (Ans.) filed August 2, 2011.

STATUS OF CLAIMS

Claims 4 and 6-11 stand twice REJECTED under 35 U.S.C. § 103.

Claims 4 and 6-11 are APPEALED.

Claims 1-3 and 5 are CANCELLED.

STATUS OF AMENDMENTS

No amendment to Claims 4 and 6-11 on appeal was submitted and/or entered after the Examiner's final rejection mailed October 27, 2010.

GROUNDS OF REJECTION TO BE REVIEWED

The final rejections of Claims 4 and 6-11 under 35 U.S.C. § 103 over Utecht (U.S. Patent 6,184,310, issued February 6, 2001) in view of Carr (US 2004/0250972 A1, published December 16, 2004), Takahata (U.S. Patent 3,933,558, issued January 20, 1976), Snow (U.S. Patent 5,830,318, issued November 3, 1998), and Koichi (JP09-217292, published August 19, 1997), as evidenced by Lai (EP 0 331 047, published September 6, 1989), and Varveri (U.S. Patent 3,639,208, February 1, 1972), are APPEALED.

ARGUMENT

The Examiner's explanation of the basis for the final rejections of Claims 4 and 6-11 under 35 U.S.C. § 103 over Utecht in view of Carr, Takahata, and Koichi, as evidenced by Lai and Varveri, (1) erroneously expands and/or contorts the prior art teachings, (2) erroneously interprets the scope of the claimed method so broadly as to be inconsistent with the supporting disclosure, and (3) downplays or ignores the closest prior art teachings favoring patentability.

1. The Examiner's findings regarding Utecht's disclosure are clearly erroneous

Without focusing on any of Utecht's specific teachings, the Examiner finds that Utecht generally discloses (Ans., p. 5, ¶ 2):

The polymers are used as retention and drainage aids and as fixatives for making all known paper, paperboard and cardboard grades by adding them to stock from 0.01% to 0.1% by weight of the dry fiber. Many of the claimed pulps are disclosed. Suitable fillers used in making papers include chalk (calcium carbonate) and titanium dioxide (col 6, line 56 to col 7, line 7; col 7, lines 14-18).

In fact, Utecht teaching at column 6, line 56, to column 7, line 20, is the only teaching in Utecht's entire disclosure which remotely pertains to Applicant's claimed method, and it reads: (Utecht, col. 6, l. 56, to col. 7, l. 20):

The carbamate-functionalized polymers are used as retention, drainage and flocculation aids and also as fixatives in papermaking. They are used in the customary amounts for this purpose. They are especially useful as processing aids in the dewatering of paper stocks which contain contraries. Contraries are, for example, ligninsulfonates or other ingredients in wood and humic acids. The carbamate-functionalized polymers to be used according to the invention can be used for making all known paper, paperboard and cardboard grades. The papers can be produced from a multiplicity of different fiber materials, for example from sulfite or sulfate pulp in the bleached or unbleached state, groundwood, pressure groundwoods (PGW), CTMP or waste paper. The retention, drainage and flocculation aids are preferably used in papermaking amounts from 0.01 to 0.1% by weight, based on the dry fiber materials. The carbamate-functionalized polymers additionally have a good fixing effect in such paper stocks as contain relatively large quantities of contraries; waste paper stocks, for example, contain contrary quantities of resins, polymeric binders and other contrary solids. To fix contraries on the fibers or in the paper, the carbamate-functionalized polymers, whether water-soluble or water-insoluble, are used for example in amounts from 0.001 to 0.1% by weight, based on dry paper stock.

The carbamate-functionalized polymers are also useful as emulsifiers for preparing aqueous filler slurries which are used for example in the preparation of filled papers. Examples of suitable fillers

are clay, chalk, titanium dioxide and kaolin. The quantities of emulsifier to prepare filler slurries range for example from 0.1 to 2, preferably from 0.5 to 1.5, % by weight, based on the aqueous slurry.

On close consideration of the specific teachings upon which the Examiner makes his general findings, the Board will find little, if any, support for the Examiner's overly broad findings of fact.

First, at column 6, lines 56-59, Utecht teaches that carbamate-functionalized polymers may be used as retention, drainage and flocculation aids and as fixatives in papermaking "in the customary amounts for this purpose" (Utecht, col. 6, ll. 58-59). At column 6, lines 59-62, Utecht teaches that its carbamate-functionalized polymers are especially useful as retention, drainage and flocculations aids and as fixatives when processing pulp made from paper stock containing "contraries".

Second, at column 7, lines 2-4, Utecht teaches that its carbamate-functionalized polymers generally may be used as retention, drainage and flocculations aids in papermaking in amounts from 0.01 to 0.1% by weight, based on the dry fiber.

Third, at column 7, lines 4-7, however, Utecht teaches that its carbamate-functionalized polymers have a good fixing effect in papermaking from paper stocks which "contain relatively large quantities of "contraries".

Fourth, at column 7, lines 7-9, Utecht defines "contraries" as "waste paper stocks, for example, contain[ing] contrary quantities of resins, polymeric binders and other contrary solids."

Fifth, at column 7, lines 9-13, Utecht teaches that “contraries” may be fixed to the pulp fibers by using its carbamate-functionalized polymers in amounts from 0.001 to 0.1% by weight, based on dry paper stock.

Sixth, at column 7, lines 14-18, Utecht for the first and only time in its disclosure refers to fillers such as chalk and titanium dioxide. However, Utecht’s discussion of fillers and filled papers appears to supplement the earlier disclosure regarding the use of its carbamate-functionalized polymers as retention, drainage and flocculations aids and as fixatives in papermaking. Utecht expressly states (Utecht, col. 7, ll. 14-18; emphasis added):

The carbamate-functionalized polymers are also useful as emulsifiers for preparing aqueous filler slurries which are used for example in the preparation of filled papers. Examples of suitable fillers are clay, chalk, titanium dioxide and kaolin.

Utecht appears to be clarifying that its previous discussion relating to use of its carbamate-functionalized polymers as retention, drainage and flocculations aids and as fixatives in papermaking does not relate to its other utility as an emulsifier for pulp slurries containing fillers such as titanium dioxide and/or chalk. As evidence thereof, Utecht teaches (Utecht, col. 7, lines 18-20):

The quantities of emulsifier to prepare filler slurries range for example from 0.1 to 2, preferably from 0.5 to 1.5, % by weight, based on the aqueous slurry.

Both Applicant, the Examiner, and this respected Board may speculate and argue what in fact Utecht’s disclosure full at column 6, line 56, to column 7, line 20, would have meant to persons having ordinary skill in the art. However,

it should be apparent to the Board, and would have been apparent to persons having ordinary skill in the art, that Utecht does not generally teach that its carbamate-functionalized polymers may be used in amounts from 0.01 to 0.1% by weight, based on the dry fiber, as retention, drainage and flocculations aids when making titanium dioxide and/or chalk filled papers or to fix titanium dioxide and/or chalk to pulp fibers when making titanium dioxide and/or chalk filled papers. This is especially true since Lai, the closest prior art, discloses that polymers having vinyl amine units, which polymers arbitrarily include carbamate-functionalized polymers according to the Examiner's interpretation of the claim language, customarily are not functionally effective as retention aids in amounts less than 0.05 wt.%. See Lai, page 5, lines 54-56; page 8, lines 32-50; and Claim 1.

Moreover, consistent with the language of appealed Claims 4 and 9, Applicant's "cationic polymer fixes the titanium dioxide and/or calcium carbonate filler particles to the fibers of the pulp . . ." (emphasis added). Utecht would have taught persons having ordinary skill in the art that its carbamate-functionalized polymers may be used as retention, drainage and flocculations aids when making titanium dioxide and/or chalk filled papers and as fixatives of titanium dioxide and/or chalk to pulp fibers when making chalk or titanium dioxide filled papers "in the customary amounts for this purpose" (Utecht, col. 6, ll. 56-59). The closest prior art evidence of record, Lai, shows that the customary amounts would appear to be no less than 0.05 wt.%. Applicant's

claims require its cationic polymer component in amounts more than 0.04 wt.% which fixes the titanium dioxide and/or chalk (calcium carbonate) to the pulp (Claims Appendix, Claims 4 and 9). Utecht would not have taught persons having ordinary skill in the art having knowledge of Lai's disclosure reasonably to expect to fix titanium dioxide and/or calcium carbonate to the pulp fibers by the claimed using no more than 0.04 wt.% of the claimed cationic polymer component.

As to the remainder of Utecht's teaching, persons having ordinary skill in the art may no more than speculate as to its meaning and intent regarding titanium dioxide and/or chalk fillers, Utecht appears to be most concerned with retaining and fixing resinous "contraries" to the pulp fibers when reproducing paper from recycled waste paper stock. However, patentability never should be resolved, and most definitely never should be denied, based on speculation. *In re Steele*, 305 F.2d 859, 862 (CCPA 1962). And, the PTO has the burden of proof to establish the factual basis for its rejections under 35 U.S.C. § 103. *In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984); *In re Warner*, 379 F.2d 1011, 1016 (CCPA 1967).

Wise APJs have often said that prior art should be considered not only for what it teaches but, and often more importantly, for what it does not teach. Here, Utecht does not teach what the Examiner finds that it teaches without reasonable support. The Examiner's findings are clearly erroneous.

2. The Examiner erroneously interpreted the scope of the claimed method

During examination, the PTO must give the claims in an application their broadest reasonable interpretation consistent with the supporting specification.

In re Suitco Surface, Inc., 603 F.3d 1255, 1259 (Fed. Cir. 2010); *In re Am. Acad. Of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004); *In re Sneed*, 710 F.2d 1544, 1548 (Fed. Cir. 1983). Claim interpretation is a matter of law. *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313 (Fed. Cir. 2005)(en banc).

Thus, the PTO must reasonably interpret the scope and content of the claims in a manner consistent with the specification. A broadest reasonable construction “cannot be divorced from the specification and the record evidence.” *In re NTP, Inc.*, ____ F.3d ___, ___ (Fed. Cir. 2011).

The Federal Circuit has instructed that construction of all the claim language, including the extent to which the transitional phase “comprising” opens the claim to other elements (*In re Suitco Surface, Inc.*, 603 F.3d at 1259), must be “consistent with the specification, . . . and that claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990)(quoting *In re Sneed*, 710 F.2d 1544, 1548 (Fed. Cir. 1983). In *In re Suitco Surface, Inc.*, 603 F.3d at 1260, the Federal Circuit stated:

The PTO’s construction here, though certainly broad, is unreasonably broad. The broadest-construction rubric coupled with the term “comprising” does not give the PTO an unfettered license to interpret claims to embrace anything remotely related to the claimed invention.

Rather, claims should always be read in light of the specification
Schroth Co. v. Cleveland Trust Co., 311 U.S. 211, 217 . . . (1940).

The Examiner found (Ans., p. 5, 1st ¶; emphasis added):

Utecht . . . discloses polymers containing vinylamine units made by converting from 0.1% to 100% of the formyl groups to vinylamine by acid hydrolysis in a polymer containing N-vinylformamide units. At least 0.1 mol%, of the vinylamine units are further converted to carbamate moieties (Abs: col. 2, lines 4-21 and 33-55; col. 3, line 59 to col. 4, line 39; col. 6, lines 1-7), which leaves in some embodiments the majority of vinylamine units uncovered.

However, then, without referring to Applicant's Specification, the Examiner concludes (Ans., p. 5, ll. 6-7), "Note that the open language of the instant claims does not preclude additional reaction of some of the vinylamine units." The Board will recognize that the open transitional phrase "comprising" in the appealed claims on its face also does not preclude additional reaction to convert any and all of the vinylamine units to carbamate moieties. However, Applicant's Specification does not teach or reasonably suggest additionally reacting any or all of the vinylamine units of the cationic polymer component of the appealed claims to convert some or all to carbamate moieties. At the very least, the existing patent law requires the Examiner to minimally consider the teaching in Applicant's Specification to determine whether any or all of the desirable vinyamine units of Applicant's cationic polymer may or should be converted to carbamate moieties.

To the contrary, consistent with the teaching in Applicant's Specification, Applicant's claims require converting 20-100% of the total formal groups in a

polymer having N-vinylformamide units to vinylamine units. Thus, the cationic polymer employed in Applicant's claimed method must have the desirable vinylamine units and N-vinylformamide units which are not 20-100% converted to the desirable vinylamine units. Consistent with the teachings in Applicant's Specification, the presence of vinylamine units is critical for successfully fixing the titanium dioxide and/or chalk (calcium carbonate) filler particles to the fibers of the pulp" as Claims 4 and 9 require. Based on the claim language of Applicant's claimed method itself, and the teaching in the Specification, any interpretation of the claim language which opens the claimed method to permit any or all of the desirable vinylamine units purposefully formed on the cationic polymer to conversion into carbamate moieties is entirely inconsistent with the Specification's teaching, design, and purpose as a whole, and generally contrary to law. *In re Suitco Surface, Inc.*, 603 F.3d at 1260:

The PTO's construction here, though certainly broad, is unreasonably broad. The broadest-construction rubic coupled with the term "comprising" does not give the PTO an unfettered license to interpret claims to embrace anything remotely related to the claimed invention. Rather, claims should always be read in light of the specification

3. The Examiner erroneously disregarded Lai's closest prior art teaching

Unlike Utecht's disclosure, Lai's disclosure specifically instructs that cationic polymers containing vinylamine units are desirable and obtainable by 20 to 100% hydrolysis of the total formyl groups in a polymer having at least N-vinylformamide units as a polymerization component for use in retaining pigment fillers such as titanium dioxide in paper formed by conventional paper

making processes. Thus, Lai appears to be the closest prior art. Lai not only generally discloses the same or substantially the same polymeric retention aids as the cationic polymers claimed containing vinylamine units, but Lai's disclosure is particularly concerned with, and Lai ran experiments to determine, the specific amounts of the disclosed polymeric retention aids which are required for successful retention of titanium dioxide filler.

Lai would have taught persons having ordinary skill in the art that hydrolyzed poly(N-vinylamides) such as hydrolyzed poly(N-vinyformamide), i.e., poly(vinylamine) and poly(vinylamine) salts, may be used in a pulp slurry to improve the retention of fillers such as titanium dioxide in paper produced by conventional papermaking processes (Lai, p. 5, 18-49). Lai expressly states (Lai, p. 5, ll. 50-57; emphasis added):

With regard to the papermaking process, such process involves an aqueous cellulose fiber (wood pulp) suspension, which may contain one or more rosin size and mineral constituents (fillers) depending on the product desired, being deposited and drained on a continuous moving wire cloth. The free water passes and drops of the cellulose fiber web which undergoes further processing to yield the desired paper product. The addition of 0.05 to 0.5 wt%, preferably 0.1 to 0.2 wt%, vinylamine polymer, based on fiber, to the aqueous cellulose fiber slurry (et-end provides for an increase in the dry strength of the paper product and an increase in the retention of titanium dioxide in those papermaking processes that use TiO₂.

Lai supports that statement by reference to its Example 12 (Lai, p. 8, ll. 21-50). In that example, Lai tested four polymers at various concentrations for their ability to retain titanium dioxide in paper made by a conventional papermaking process (Lai, p. 8, ll. 21-50). The "polymers were added to the fiber suspension

... at addition levels of 0, 0.01, 0.05, 0.1, 0.2 and 1% based on fiber", and the resulting papers were tested for % TiO₂ Retention using a Tappi standard method (Lai, p. 8, ll.32-35). Lai reported the following results in Table 4 as follows:

<u>Polymer</u>	<u>% TiO₂ Retention</u>
VAm (7MM)	93.1
VAm (80 M)	83.3
PAM (2-4 MM)	85.6
<u>PAM (<1 MM)</u>	<u>54.0</u>

VAm (7MM) is a vinylamine homopolymer with a molecular weight of 7,000,000. VAm (80M) is a vinylamine homopolymer with a molecular weight of 80,000. PAM (2-4 MM) is a polyacrylamide polymer with a molecular weight of 2,000,000-4,000,000. PAM (<1 MM) is a polyacrylamide polymer with a molecular weight of <1,000,000.

Lai concluded (Lai, p. 8, ll. 49-5), "It can be seen that the 7MM molecular weight poly(vinylamine) demonstrated a superior TiO₂ retention at 0.1-0.2% addition level to wood pulp." Moreover, Lai suggests that four times as much low molecular weight poly(vinylamine) polymer would be required to achieve the same effective dry strength in papermaking using high molecular weight poly(vinylamine) polymer (Lai, p. 8, ll. 14-16).

Thus, Lai would have led persons having ordinary skill in the art to understand that no less than 0.05 wt%, preferably no less than 0.1 wt%, of a poly(vinylamine) polymer, based on the dry fiber, is required to improve the retention and uniformity of retention of titanium dioxide and chalk (calcium carbonate) filler in paper produced by conventional papermaking processes. In view of Lai's disclosure, persons having ordinary skill in the art would have

been led to expect that no less than 0.05 wt.%, preferably no less than 0.1 wt.%, of poly(vinylamine) polymer, whether carbamate-functionalized in part or not, would have been customarily used for producing paper which retains more titanium dioxide and/or Chalk (calcium carbonate) filler than would be retained when producing paper by conventional papermaking processes without the use of a poly(vinylamine) polymer. The customary amount of poly(vinylamine) polymer that Lai recommends for improving titanium dioxide and/or chalk (calcium carbonate) retention is significant because Utecht expressly states that its carbamate-functionalized polymers are used as retention, drainage and flocculation aids and also as fixatives in papermaking “in the customary amounts for this purpose” (Utecht, col. 6, ll. 56-59).

Alas, the Examiner consents to consider, and for the first time considers, Lai’s closest prior art teaching in the Examiner’s Answer (Ans., pp. 9-12). However, the Examiner finds that, while Lai would have taught persons having ordinary skill in the art that improved retention of titanium dioxide and chalk (calcium carbonate) filler by pulp could be obtained using 0.05 wt.% and higher, preferably 0.1 wt.% and higher, during the papermaking process, Lai definitely would not have suggested to a persons having ordinary skill in the art that Applicant’s claimed amount of from 0.0005 to 0.04 wt.% poly(vinylamine) polymer would be ineffective. Rather, the Examiner argues that persons having ordinary skill in the art reasonably would be expected to obtain improved retention of titanium dioxide and/or calcium carbonate filler using less than 0.05

wt.% of poly(vinylamine) polymer, and any contrary conclusion “has no basis in fact” (Ans., p. 12, 1st full ¶, last two sentences). Even so, the Examiner acknowledges (Ans., pp. 10-11, bridging ¶), “Lai et al is concerned with both retention and in improving dry strength through the addition of vinylamine polymers and recites the addition of at least 0.05 to 0.5 wt.% and preferably 0.1 to 0.2 wt.% of polymer based on fiber to accomplish these goals (p. 5, lines 54-57).”

Ultimately, the Examiner maintains the final rejections of Applicant’s claimed methods in this case for the following reasons (Ans., p. 12, 1st full ¶):

Appellant states . . . that “Lai . . . could not achieve improved retention in its experiments utilizing less than 0.05 wt.% poly(vinylamine) homopolymer.” This statement . . . is without factual basis because Lai . . . fails to comment on the use [of] the polymers in lesser amounts for retention, and because Lai . . . recites a minimum of 0.05 wt.% to provide retention and dry strength. In addition, Utecht . . . discloses using a lesser amount of its polymers as retention, drainage and flocculation aids.

In effect, the Examiner finds that prior art teaching of a minimum effective amount of poly(vinylamine) useful as a retention aid does not teach that lesser amount would not be effective. In effect, the Examiner finds that Utecht’s teaching that carbamate-functionalized polymers containing residual vinylamine units generally are generally useful as retention, drainage, and flocculation aids in customary amounts for those purposes, which may be as low as 0.01 wt.% for retention of “contraries,” necessarily contradicts Lai’s teaching that poly(vinylamine) polymers improve retention of titanium dioxide

and chalk (calcium carbonate) filler in amounts no less than 0.05 wt.%.

Applicant asks the Board to consider the combined teachings of Lai and Utecht for everything they would have suggested to persons having ordinary skill in the art. Then, the Board is asked to consider the express language of Applicant's claimed methods which states that "the cationic polymer fixes the titanium dioxide and/or calcium carbonate filler particles to the fibers of the pulp and thereby enhances the ash content and opacity of the filler-containing paper produced relative to the ash content and opacity of the filler-containing paper produced without including the cationic polymer in the pulp slurry" (Claims Appendix, Claims 4 and 9; emphasis added).

The combined teachings of Utecht and Lai reasonably would not have suggested the method Applicant claims to persons having ordinary skill in the art. And, while the additional teachings of Carr, Takahata, Snow, Koichi, and Varveri might have provided persons having ordinary skill in the art with the teaching, suggestion, motivation, or incentive to make and use various papers having improved contents of titanium dioxide and/or chalk (calcium carbonate) filler, the combined teachings of the prior art disclosures would not have enabled persons skilled in the art to make and use the method Applicant claims with any reasonable expectation of success, as is required to sustain a conclusion of obviousness thereover. The prior art must enable one skilled in the art to make and use the disclosed and claimed method without undue experimentation in order to sustain a rejection for obviousness under 35 U.S.C.

§ 103. *In re Hoeksema*, 399 F.2d 269, 274 (CCPA 1968). The prior art also must have led the person having ordinary skill in the art to reasonably expect that the claimed subject matter could be successfully made and used. *In re O'Farrell*, 853 F.2d 894, 903 (Fed. Cir. 1988); *In re Dow Chemical Co.*, 837 F.2d 469, 473 (Fed. Cir. 1988); *Merck & Co., v. Biochraft Laboratories, Inc.*, 874 F.2d 804, 809 (Fed. Cir. 1989).

Having considered all the evidence and arguments of record, Applicant is confident this Board will honor its request to Reverse the Examiner's final rejections.

Therefore, for the reasons stated herein:

The final rejections of Claims 4 and 6-11 under 35 U.S.C. § 103 over Utecht in view of Carr, Takahata, Snow, Koichi, Lai, and Varveri for obviousness are erroneous and should be REVERSED.

Respectfully submitted,

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